



Plague

Information for the Public

What is plague?

Plague is an infectious disease that affects animals and humans. It is caused by the bacterium *Yersinia pestis*. This bacterium is found in rodents and their fleas and occurs in many areas of the world, including the United States. Plague is an ancient disease that occurs in irregular cycles. Millions of people in Europe died from plague in the Middle Ages, when flea-infested rats inhabited human homes and places of work. In the United States, the last urban plague outbreak occurred in Los Angeles in 1924-25.

How do people become infected with plague?

People can get plague several ways:

- By the bites of infected fleas.
- By direct contact with the tissues or body fluid of a plague-infected animal.
- By inhaling infectious airborne droplets from persons or animals, especially cats, with plague pneumonia.
- By laboratory exposure to plague bacteria.
- Inhalation of an aerosol in a bioterrorist attack

Are there several forms of plague?

- **Pneumonic plague** occurs when *Y. pestis* infects the lungs. This type of plague can spread from person to person through the air. Pneumonic plague can be transmitted by breathing in *Y. pestis* in respiratory droplets from a person or animal with pneumonic plague. Respiratory droplets are spread by coughing or sneezing. Becoming infected in this way usually requires direct and close (within six feet) contact with the ill person or animal.
- **Bubonic plague** is the most common form of plague. This occurs when an infected flea bites a person or when materials contaminated with *Y. pestis* enter through a break in a person's skin. Bubonic plague does not spread from person to person.
- **Septicemic plague** occurs when plague bacteria multiply in the blood. It can be a complication of pneumonic or bubonic plague or it can occur by itself. Septicemic plague does not spread from person to person.

Does plague occur naturally?

The World Health Organization reports 1,000 to 3,000 cases of plague worldwide every year. Although plague does not occur naturally in Michigan, about 5-15 cases occur yearly in the southwestern part of the US (Arizona, New Mexico, Colorado, California, and Utah). These cases are usually scattered and occur in rural to semi-rural areas. Most cases are of the bubonic form of the disease. Naturally occurring pneumonic plague is uncommon, although small

outbreaks do occur. Both types of plague are readily controlled by standard public health response measures.

How quickly would an exposed person get sick?

Someone exposed to *Yersinia pestis* would become ill within one to six days.

What are the symptoms of plague?

- **Pneumonic plague** – or plague pneumonia, develops when the bacteria infect the lungs. People with plague pneumonia have high fever, chills, difficulty breathing, a cough, and bloody sputum. Plague pneumonia is considered a public health emergency because a cough can quickly spread the disease to others. Untreated pneumonic plague is usually fatal.
- **Bubonic plague** –When a person is bitten by an infected flea or is infected by handling an infected animal, the bacteria move through the bloodstream to the lymph nodes. The lymph nodes swell, causing painful lumps. Other symptoms are fever, headache, chills, and extreme tiredness. Some people have gastrointestinal symptoms.
- **Septicemic plague** – If bubonic plague goes untreated, the bacteria can multiply in the blood stream and produce plague septicemia, a severe blood infection. Patients with septicemic plague experience fever, chills, tiredness, abdominal pain, shock, and bleeding into the skin and other organs. Untreated septicemic plague is usually fatal.

What is the mortality rate of plague?

About 14% (1 in 7) of all plague cases in the United States are fatal.

What should someone do if they suspect they have the plague?

Someone who suspects they have the plague should get immediate medical attention. To prevent illness, a person who has been exposed must receive antibiotic treatment without delay. If an exposed person becomes ill, antibiotics must be administered within 24 hours of their first symptoms to reduce the risk of death. Patients with suspected plague should be hospitalized, placed in isolation, and have specimens obtained for plague diagnosis.

Can a person exposed to the plague avoid becoming sick?

People who have had close contact with an infected person can greatly reduce the chance of becoming sick if they begin antibiotic treatment within seven days of their exposure. Treatment consists of taking antibiotics for at least seven days.

Who should be notified of a suspected case of plague?

Immediately notify your local health department so they can begin to investigate and control the problem right away. For a listing of local health departments see: <http://www.malph.org/page.cfm/108/>. Your doctor should contact the local health department if they suspect you have been exposed to the plague. The local health department will notify the Michigan Department of Community Health who will communicate with the Centers for Disease Control and Prevention. If terrorism is suspected, the health departments will notify the FBI and other appropriate authorities.

Could plague be used as a biological weapon?

Plague could be used as a weapon because the bacterium occurs in nature and could be isolated and grown in quantity in a laboratory. If the bacterium were used in an aerosol attack, people would develop the pneumonic form of plague in one to six days. Once people have the disease, the bacteria can spread to others who have close contact with them. Because of the delay between being exposed to the bacteria and becoming sick, people could travel over a large area, infecting others. Controlling the disease would then be more difficult.

How can plague be prevented?

People who live, work, or play in areas with active plague infection in wild rodents should take these precautions:

- Eliminate food and shelter for rodents around homes, work places, and certain recreation areas, such as picnic sites or campgrounds where people congregate. Remove brush, rock piles, junk, and food sources, including pet food.
- Allow health authorities to use appropriate and licensed insecticides to kill fleas during plague outbreaks in wild animals.
- Treat pets (cats and dogs) for flea control regularly.
- Avoid sick or dead animals, and report such animals to the health departments. Hunters and trappers should wear rubber gloves when skinning animals.
- Use insect repellents when outdoors in areas where there is a risk of flea exposure.

How long can plague bacteria exist in the environment?

Yersinia pestis is easily destroyed by sunlight and drying. However, when released into air, the bacterium will survive for up to one hour, depending on conditions.

Who should receive preventive treatment?

Preventive treatment with antibiotics is recommended for:

- People who are bitten by fleas during a local outbreak or who are exposed to tissues or fluids from a plague-infected animal.
- People living in a household with a bubonic plague patient, since they may also be exposed to infected fleas.
- People in close contact with a person or pet with suspected plague pneumonia. Close contact is defined as face-to-face contact or being in the same closed space, such as a room or vehicle.
- Persons exposed to plague in an aerosol attack

Currently, no plague vaccine is available in the United States. Research is in progress, but we are not likely to have vaccines for several years or more.

What is Michigan doing to combat this health threat?

The Michigan Department of Community Health is working closely with physicians to make them aware of the signs and symptoms of plague and laboratories to be able to identify the plague bacteria. Increased surveillance by local health departments is incredibly important in our efforts to detect bioterrorism, investigate potential cases, and ensure that patients will be cared for properly with minimal risk to other individuals. Hospitals, health care providers, and health departments throughout the state are prepared to follow the protocols and recommendations for care set by the Centers for Disease Control and Prevention to ensure patient safety.

For more information on plague:

- Contact your local public health department. Check <http://www.malphp.org/page.cfm/108/> for your jurisdiction. A list of local public health departments is also available at http://www.michigan.gov/documents/June2003LHDLList_69658_7.pdf
- Visit the Michigan Department of Community Health website <http://www.michigan.gov/ophp>
- Visit The Centers for Disease Control and Prevention (CDC) website, <http://www.bt.cdc.gov/agent/plague/index.asp>
- Call the Centers for Disease Control and Prevention Public Response Service Hotline:
English: 1-888-246-2675
Español: 1-888-246-2857
TTY: 1-866-874-2646